AIR CONDITIONER TEMPERATURE EXCHANGER

BACKGROUND OF THE INVENTION

(a) Field of the Invention

The present invention relates to an air conditioning system, and more particularly, to a temperature exchanger that achieves the same air cooling effect without a compressor and coolant in an air conditioner.

(b) Description of the Prior Art:

The temperature of the earth increases gradually by year due to glasshouse effect. Usually, a conditioner is installed to bring down the ambient temperature as the one illustrated in Fig. 1 of the accompanying drawings of the present invention. Wherein, a compressor 10' is used to compress and cycle air coolant in a coil 20' for exchanging air temperature by absorbing hot air and releasing cool air. However, production and reclaim of coolant have caused serious pollution to the environment. Besides, mass CO2 discharged in the course of air exchange only deteriorates the glasshouse effect. Therefore, the use of coolant in air conditioning system shall be controlled and minimized by seeking alternatives to substitute the coolant, and finally, eliminated to protect our ecological environment. This has been a common objective sought by the global community.

SUMMARY OF THE INVENTION

The primary purpose of the present invention is to provide an air temperature exchanger that achieves the same air cooling effect in an air conditioner without the use of an air compressor and coolant. To achieve this purpose, a DC source is applied to an air temperature exchange baseboard to create temperature difference (ΔT) between both contact surfaces of the baseboard. That is, one contact surface refers to a cold one and the other, hot one. By maintaining a consistent electric power conversion efficiency and proper control of

the ΔT, a better cooling effect by the cold contact surface is attainable when a better heat dissipation is relatively achievable on the hot contact surface to warrant a stable air temperature exchange by the baseboard.

Both said contact surfaces of the baseboard then are respectively connected to a hot conductor and a cold conductor. Each conductor has a closed interior containing liquid and is provided with a water inlet and a water outlet to respectively connected to a pipeline comprised of a cooling coil and a heat dissipation coil from the air conditioner. Therefore, both conductors give air temperature exchange effect to the liquid circulating in the pipeline to facilitate cooling the air temperature by the cooling coil and heat dissipating by the heat dissipation coil.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view showing interior components of a prior art of an air conditioner.

Fig. 2 is an elevation view showing an air temperature exchanger of the present invention.

Fig. 3 is an exploded view of members of the present invention.

Fig. 4 is a side view showing the air temperature exchanger of the present invention.

Fig. 5 is a sectional view showing the air temperature exchanger of the present invention.

Fig. 6 is a view showing a preferred embodiment of the present invention.

Fig. 7 is view showing another preferred embodiment of the present invention.

Fig. 8 is a schematic view showing a heat dissipation tube adapted to a heat dissipation pipeline in the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figs. 2 through 5, an air temperature exchanger of the present invention is essentially comprised of an air temperature exchange baseboard 10 having a cold conductor 20 and a hot conductor 30 respectively provided on both sides of the baseboard 10.

Multiple conduct crystals 13, comprised of Sb, Bi, and other elements are connected between two contact boards 11, 12 respectively from two said baseboards 10. Among the crystal 13, a positive electrode of a crystal 13 is connected to a negative electrode of another crystal 13 in sequence between said two contact boards 11, 12. Therefore, when a DC is applied to an extension from the multiple crystals, a temperature difference ΔT is created between both said contact boards 11, 12. That is, the contact board 12 dissipates heat and the contact board 11 cools air temperature, or vice versa. (Details of members comprising the baseboard 10 will not be disclosed here since they are not the subject matter for this application).

Each of said cold conductor 20 and the hot conductor 30 relates to a closed container 21 (31) containing liquid. A water inlet connector 22 (23) is provided at the top and a water outlet 23 (33) is provided at the bottom of the conductor 20(30) to connect through said closed container 21 (31). Both of said conductors 20 and 30 are locked to each other with four screws provided at four corners of each conductor to bind the conductor 20 to the conductor 30 and for both conductors 20, 30 to hold the baseboard 10 secured in between.

Furthermore, a consistent DC power is applied to the baseboard 10 to secure the ΔT created by the baseboard 10. The baseboard 10 provides optimal air temperature exchange by properly controlling the ΔT. That is, by improving heat dissipation effect of the contact

surface 12, better cooling effect is relatively achieved by the other contact surface 11. To promote heat dissipation efficiency for the conductor 30, three sides other than that bound to the baseboard 11 of the conductor are integrated with fins 34 arranged in parallel and at an equal spacing to any given abutted pair of said fins. A fan 35 is adapted to said fins to even further promote the general heat dissipation efficiency of the conductor 30.

Now referring to Fig. 6, an air temperature exchanger of the present invention is applied in an air conditioning system. An outflow pipe 41 from a cooling coil in the air conditioning system is connected to the water inlet 22 of the conductor 20 and the outlet 23 of the conductor 20 is connected with a pipe to an inflow 51 of a pump 50. An outflow from 52 said pump is connected to an inflow 42 of a cooling coil 40 to form a closed loop of cooling pipeline with the conductor 20 that is driven by the pump 50. Liquid for circulation may be in a form of water or any other cooling liquid to be filled into the container 21 of the conductor 20. Hot ambient air is drawn by an eccentric fan 70 provided in the air conditioning system to form air convection and absorbed by multiple fins 43 covering the cooling coil 40 to have heat exchange with the cooling liquid circulating inside the air conditioning system. The temperature of the cooling liquid rises for absorbing the hot ambient temperature flows through the container 21 of the conductor 20 to be cooled by the contact surface 11 of the baseboard 10 before re-circulating through the pipeline of the cooling coil 40 to cool the ambient air temperature.

Relatively, a sound heat dissipation unit is required to be provided between the hot air exchanged between the contact surface 12 of the baseboard 10 and the hot air inside the air conditioning system to discharge the hot air after cooling and to improve cooling effect of the present invention. Therefore, an outflow 61 from a hot

coil 60 of the air conditioning system is connected in a pipeline to the water inlet 32 of the conductor 30, and the water outlet 33 of the conductor 30 to an inflow 54 of another pump 53. Meanwhile, an outflow 55 of the pump 53 is connected in a pipeline to an inflow 62 of the hot coil 60 to form a closed heat dissipation loop with the conductor 30 that is driven by the pump 53. When a blade fan 80 expels the hot air out of the air conditioning system to form air convection. Wherein the hot air is absorbed by said multiple fins 63 covering the hot coil 60 and to have heat exchange with the cooling liquid circulating in the pipeline to bring down the ambient temperature. The temperature of the cooling liquid rises and flows through the container 31 of the conductor 30 to have the heat dissipated by said multiple fins 34 and the fan 35 provided externally to the conductor 30 for further bringing down the temperature of the cooling liquid. In addition, heat from the contact surface 12 of the baseboard 10 can be dissipated by the conductor 30. The re-circulation of the cooling liquid inside the pipeline of the conductor reduces the temperature of the hot air inside the air conditioning system before the hot air is expelled. It also effectively improve heat dissipation by the baseboard 10, thus to accelerate the cooling effects by the ΔT created by the baseboard 10 and to relatively promote the cooling effect for the ambient temperature.

As illustrated in Fig. 7, more than one unit of the air temperature exchanger of the present invention can be applied in an air condition system to facilitate cooling the air. Or, the pipeline of the water outlet 33 of the conductor 30 can be provided in a heat dissipation facilitator 90 as illustrated in Fig. 8. Wherein, the facilitator 90 relates to a tube containing liquid inside and surrounded by fins to achieve fast heat dissipation for the cooling liquid passing through it. A pipeline is used to connect an outflow of the facilitator

90 to the inflow 54 of the pump 53 to circulate the cooling liquid for increasing heat dissipation efficiency of the air condition system. For saving of production cost and less space consumption, the pump 53 with lower output power and compact is preferred.

The present invention as disclosed above may replace the coolant generally used in an air condition system to achieve the same or better cooling effect to the ambient temperature by converting electric power into freezing energy. The present invention by saving energy cost of the expensive coolant and providing environmental benefits to allow commercial production is practical and gives higher expected value of economy.